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IBM General Session: Driving Middle-Tier Innovation With Open Technologies

by Leslie T. O'Neill

With the bold declaration of making the world a "smarter planet" where we all "work better, smarter, faster, and together," IBM took the stage to present the Thursday afternoon general session at the 2009 JavaOne conference. The session title was *Extreme Transaction Processing and Elasticity -- The Answer for Your Most Demanding Applications*.

Speaker Craig Hayman, IBM's vice president of WebSphere software, introduced IBM's open-source-based solutions to the increasingly common problems that companies face when they run extreme transaction-processing applications. Research firm Gartner defines *extreme transaction processing* as "an application style aimed at supporting the design, development, deployment, management, and maintenance of distributed transaction processing applications characterized by exceptionally demanding performance, scalability, availability, security, manageability, and dependability requirements."

"The middle tier is a very vibrant place for innovation right now," said Hayman.

In today's general session, Hayman introduced the developer community to IBM's vision for extreme transaction processing, which will help ensure that your Java technology-based application infrastructure and IBM Smart SOA (service- or systems-oriented architecture) is flexible enough to support even your most demanding applications.

Hayman credited Java technology, open source, open standards, open architectures, and involvement from the developer community with making IBM's "elastic data grid" -- and the commercial products aimed at adding flexibility to your enterprise -- possible. IBM's current goal is to develop software that better supports transaction-intensive services. In turn, that will help you deliver more consistent and predictable response times to users.

To demonstrate some of the work that IBM has been doing with open source to innovate in the middle tier, Hayman called to the stage Ted Ellison, vice president of the Apache Software Foundation and an IBM senior technical staff member, to give a demonstration of the Apache Harmony project.

"This is not your father's runtime," said Ellison of this free, open-source implementation of Java SE (Standard Edition). The Harmony project was started in 2005 to provide an independent yet compatible implementation of the Java runtime, and Hayman said that it has become the foundation for next-generation runtimes.

"It's very capable, has been developed over the last four years with the community, and it's based on a well-trusted modular system," Ted Ellison added.

Ellison's demo revealed Apache Harmony to be very modular, and developers can generally expect that just about any Java module dropped into Apache Harmony will work. For example, he showed the audience how to use OSGI's plug-in development environment, just one of the many standard tools that developers can easily plug into Harmony. His demo also included walk-throughs of Harmony's boot directory, its use of tightly integrated Eclipse modules, and more.

The Apache Harmony project is more than an exercise in Java runtime innovation for IBM. According to Hayman, Apache Harmony is in broad commercial use. In fact, IBM's Lotus Notes and SameTime, Symphony, and Expedito are all built on a Harmony base.

IBM's development model is to collaborate deeply on innovative open-source projects that may be suitable for the enterprise, such as Apache Harmony, Tuscany, OSGI, and DoJo, and then integrate those innovations into its commercial products, such as WebSphere, Lotus Notes, and more.

IBM's vision for a more elastic approach to dealing with extreme transaction application includes its WebSphere



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portfolio of products. Hayman also introduced the new "very, very effective" WebSphere eXtreme Scale application, which aims to improve the caching operation in the middle tier.

"We've inserted a new tier to do some of the cache instead of existing applications," said Hayman.

With traditional cache operations, the cache capacity is determined by the system's individual JVM^{*} size, and several problems are common, including invalidation chatter, spiking loads on the database when the cache is invalidated, and redundant copies of data that are never accessed. eXtreme Scale aims to solve these problems by determining the cache capacity by the total cluster size. This reduces invalidation chatter, eases the load on the database, and eliminates cold-start spikes on the database. eXtreme Scale can also operate across zones, which you can define as either a data center, a specific chassis, or a room in your office building.

Hayman also showed the impact of eXtreme Scale on systems' memory utilization. In a slide, he showed that a working set can be stabilized across all servers even though the workload is actually changing dramatically, spreading the workload evenly across the servers.

IBM is also working to enhance transaction processing with the garbage collection performed by the WebSphere Realtime JVM. Combined with eXtreme Scale, it gives you better control over garbage-collection jitter, reduces grid latency, and results in better memory utilization.

Finally, Hayman discussed IBM's Web Application Server (WAS) for developers, which has Java technology at the core for simple, secure, and speedy development and deployment. WAS is now free for developers to download, and it is one of the applications that IBM will be making available through the Amazon Elastic Compute (Amazon EC2) cloud.

Before closing the general session, Hayman called on all the developers in the audience to take action and to commit to contributing their innovations to the open-source community.

* As used on this web site, the terms "Java Virtual Machine" and "JVM" mean a virtual machine for the Java platform.

For More Information

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